Discussion

The Embu drought primarily affected only one growing season. While the rains of 1983 were also sub-standard, their impact on production was not as serious as the 1984 long rain deficit. (Trostle, 1990) Household and community food reserves were very scarce and while they did serve to reduce the impact of the production failure, they were unable to sustain the normal level of energy intake. There was some food relief in the region. The Nutrition CRSP Program sponsored and managed a relief program which supplied a limited quantity of maize, beans, dry milk, and cooking oil to all households in the study area.[4] There was very little relief from the government or other agencies such as the church.[5]

In spite of these efforts, energy intakes suffered significantly. Of special concern to food assistance policy is that the burden of the shortage not be placed on the most vulnerable members of the household. Assessment of an individuals ability to absorb the shortage is very difficult and requires much more intense examination of the energy requirements of each individual and the utility of their energy expenditure to the vitality of the household. However, some preliminary observations can be made about the acceptability of burden as it pertains to various individuals.

The first observation is that the burden placed on pregnant and lactating women seems to be excessive. Their intakes were unacceptable during normal periods of production but during the shortage they fell to seriously low levels. It has been shown that poor nutritional status during pregnancy, especially the last two trimesters, is a primary constraint in achieving the recommended growth and maintenance of the fetus, and maternal tissues. (National Academy of Sciences 1990) Energy requirements increase during pregnancy because of the increased mass of metabolically active tissues as well as increased demands on the cardiovascular and respiratory systems. While some of this extra demand may be met by reduction in activity level, there is general agreement that an excess energy intake of between 200 to 300 kilocalories/day is necessary to promote a successful pregnancy outcome. (FAO/WHO/UNU 1985; National Research Council 1989) Given that Embu women actually experienced decreases of approximately 300 kcals/day during the food

[4] Aid was given out to all households regardless of whether they were participating in the study or not.
[5] It is entirely possible that the lack of food aid from other sources was due to the fact that the CRSP Project was on site and was conducting it own assistance program. Had CRSP not been present it is difficult to say exactly what the response of other groups would have been.

shortage, the cost of the drought may be measured in an increase in the number of low birthweight babies, higher infant morbidity and mortality, and an increased need for medical services.

The next vulnerable group was lactating mothers. The benefits of lactation are well documented. It has a positive role to play in reducing infant morbidity. (Jelliffe and Jelliffe, 1983; Glass et al, 1983; Sauls, 1979) Breast-feeding also is critical in child growth and development (Mahmood, 1987; Barros, 1986; Butte, 1984) Energy requirements during lactation relate directly to the amount of milk produced. While some of the energy requirements needed during lactation may be met by fat stores laid down during pregnancy, it is estimated that an additional 500 kilocalories/day are needed by lactating mothers. (National Research Council, 1989) For regions like Embu this allowance may even be too low given that women had sub-normal energy intakes during pregnancy (regardless of the food shortage). While there is no evidence at this time of any reduction in breast-feeding during the food shortage, attention must be given to the physiologic capacity of mothers to breast-feed during food shortages of this type and the consequential impact on the infants.

Another area of concern during the food shortage is the intake levels of school age children. It has been reported that school absenteeism did increase during the food shortage because of the need to use income previously targeted for the payment of school fees to purchase food and because of the physically weakened state of children resulting from lowered food intake. (Trostle, 1990) Studies suggest that child nutrition is important for proper cognitive development and that events such as this food shortage can have lasting consequences on these individuals. (National Diary Council, 1968; Brozek, 1978) Subjecting schoolers to the same level of deprivation as adults may be acting contrary to their needs and could have lasting impact on their cognitive development.

The recognition of different levels of vulnerability suggests that food aid be targeted to specific individuals depending on their needs. As was seen their was little change in the food distribution patterns within the household over the course of the food shortage. Interjection of food aid into the household, therefore, is subject to the same pattern of maldistribution that existed during periods of normal intake. One possible solution could be feeding programs at sites where the targeted individual can be reached. School feeding programs, for example, can target school age children. Perhaps feeding supplementation programs in clinics or other sites which can attract pregnant and lactating women can direct

food aid to support their increased needs. The intent of these efforts should be to break the pattern of maldistribution prevalent in the home and to increase the intakes of specific individuals based on their metabolic and energy expenditure needs.

This paper deals only with energy intake in the form of kilocalories. It must also be kept in mind that reduction in total energy intake carries with it the increased potential for specific nutrient deficiencies. These deficiencies arise not only form the reduction in total intake but also from the changing quality of the diet. Substitution of foods can produce unexpected alterations in the intake levels of certain nutrients. Given that no new foods were introduced in the food aid, it may be that certain nutrients were lost as the diversity of the diet was restricted. Changes in dietary diversity and quality during a food shortage must be further explored to fully understand the impact an event such as drought has on an individual's health and well-being. The dynamics of how an individual or household is impacted by an event such as drought are not clearly understood by researchers who would prescribe policy actions to ameliorate the ravages of drought. Further research will expand our understanding and enhance our ability to formulate constructive and beneficial responses to this age-old hazardous event which continues to threaten the lives and well-being of millions of people whose energy intake is subject to the vagaries of climate.

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